PROPOSED REMEDIAL ACTION PLAN

OR - Haverstraw Clove & Maple MGP
Operable Unit Number: 02
Haverstraw, Rockland County
Site No. 344049
December 2011

Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal of hazardous wastes at the site has resulted in threats to public health and the environment that would be addressed by the remedy proposed by this Proposed Remedial Action Plan (PRAP). The disposal of hazardous wastes at this site, as more fully described in Section 6 of this document, has contaminated various environmental media. The proposed remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for the preferred remedy.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York; (6 NYCRR) Part 375. This document is a summary of the information that can be found in the site-related reports and documents in the document repository identified below.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all PRAPs. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repository:

Haverstraw King's Daughters Library
Rosman Center - 10 West Ramapo Road
Garnerville, NY 10923
Phone: 845-786-3800

A public comment period has been set from:

1/6/2012 to 2/6/2012

A public meeting is scheduled for the following date:

1/19/2012 at 7:00 PM

Public meeting location:

Haverstraw Village Hall
40 New Main Street
Haverstraw, New York

At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP.

Written comments may also be sent through 2/6/2012 to:

William Ports
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
wfports@gw.dec.state.ny.us

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, Voluntary Cleanup Program, and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Location: The Orange and Rockland Utilities (O&R) Clove and Maple site is a former manufactured gas plant (MGP) and is located at 120 Maple Avenue in a residential and commercial portion of Haverstraw, Rockland County, New York. The Site is divided into three operable units (OU1-3). The former MGP site (OU1) is approximately 1 acre in size and was operated from 1887 through 1935. The site ceased operation in 1935 after the introduction of natural gas in the area. OU1 (the site) is bounded by two residential properties to the northwest, a residential apartment complex and a former pond area to the northeast, Clove Avenue to the southwest and Maple Avenue to the southeast. The OU2 area is an off-site area consisting of several residential properties including the apartment complex and is located across Clove Avenue to the northeast of OU1. OU3, also an off-site area is the adjacent Hudson River Embayment to the east of OU2.

Site Features: The site (OU1) is currently owned by O&R and was utilized as a natural gas regulator station until 2007 at which time the station was decommissioned. It is currently vacant and only the piping associated with the former regulator station remains at the site. The OU2 area consists of several single family residents and an apartment complex. OU3 is the adjacent Hudson River embayment where a stormwater pipe from the OU 2 area discharges to the Hudson River.

Current Zoning/Uses: The OU1 portion of the site is zoned for light industrial uses while OU2 is zoned residential.

Historic Uses: The O&R Clove and Maple site was the location of a former gas manufacturing plant which operated from 1887 through 1935. The plant structures were demolished in the 1960s and the property was subsequently used as a natural gas regulator station. Prior to the MGP operations at the Clove and Maple site, a gas plant was in operation at 93B Maple Avenue. The 93B site (Site No. 344044) is located northwest of the Clove and Maple site on the opposite side of Maple Avenue. The 93B MGP Site and nearby properties were previously investigated and remediated in 2003 and 2005.

Operable Units: The site was divided into three operable units. An operable unit represents a portion of a remedial program for a site that for technical or administrative reasons can be addressed separately to investigate, eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination. Operable unit 1 (OU1) is the on-site former MGP area (the O&R property) and drainage swale. OU2 consists of off-site properties including single family residential properties, an apartment complex, a portion of an alleyway, and a portion of Maple Avenue. OU3 consists of sediments in the Hudson River embayment located close to the site.

Site Geology and Hydrogeology: The site is located at the base of High Tor Mountain and is characterized by moderate relief with the ground surface sloping approximately 25 feet to the north. Site geology consists of four geologic units and they are from top to bottom: 1) fill, with thickness ranging from 5 feet to approximately 15 feet, and consisting of cobbles, gravel, cinders

and coal; 2) alluvium (7 feet to 25 feet thick) consisting of silt and clay, including coarse-grained sand and gravel; 3) glacial lucustrine clay, with thickness ranging from 2 feet to 18 feet and; 4) clay consisting of dense silty clay with thickness ranging from 17 feet to about 36 feet. The on-site and off-site groundwater flows northeasterly towards a former pond area and the Hudson River. The former pond area is located under the apartment complex and its parking lot. This pond area was also part of a former stream channel that emptied into the Hudson River. The depth of groundwater varies throughout the site with typical depths of 5 feet to 8 feet below ground surface.

Operable Unit (OU) Number 02 is the subject of this document.

A Record of Decision was issued previously for OU 01. A Record of Decision has yet to be issued for OU 03.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives (or an alternative) that restrict(s) the use of the site to residential use (which allows for restricted-residential use, commercial use and industrial use) as described in Part 375-1.8(g) are/is being evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the investigation to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the site, documented to date, include:

Orange and Rockland Utilities, Inc.

This MGP Site is part of the Orange and Rockland Utilities (O&R) multi-site Consent Order. The Department and O&R entered into Consent Orders in January 8, 1996 (D3-0002-94-12) and September 29, 1998 (D3-0001-98-03). These orders were superseded by and Order dated March 11, 1999 (D3-0001-99-01). The Orders obligate O&R to implement a full remedial program.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibit A list the applicable SCGs in the footnotes. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Information

The analytical data collected on this site includes data for:

- air
- groundwater
- soil
- soil vapor
- indoor air

The data have identified contaminants of concern. A "contaminant of concern" is a hazardous waste that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action

are summarized in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified for this Operable Unit at this site is/are:

coal tar	chrysene
benzene	fluoranthene
toluene	fluorene
ethylbenzene	indeno(1,2,3-cd)pyrene
xylene (mixed)	benzo(a)pyrene
naphthalene	benzo(ghi)perylene
anthracene	dibenz[a,h]anthracene
acenaphthene	phenanthrene
benzo[k]fluoranthene	pyrene

As illustrated in Exhibit A, the contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- soil

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

There were no IRMs performed at this site during the RI.

6.3: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure.*

Operable Unit 1 (OU-1) - The site is completely fenced, which restricts public access. However, persons who enter the site could contact contaminants if they were to dig or otherwise disturb the soil located beneath the gravel cover material. People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Volatile organic compounds in the groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Because there is no on-site building, inhalation of site contaminants in indoor air due to soil vapor intrusion does not represent a concern for the site in its current condition. The potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site development and occupancy.

Operable Unit 2 (OU-2) - Contact with contaminated soil or groundwater is unlikely unless people dig below the ground surface. People are not drinking the contaminated groundwater

because the area is served by a public water supply that is not affected by this contamination. Sampling indicates soil vapor intrusion is not a concern for buildings in OU-2.

Operable Unit 3 (OU-3) - The potential exists for people to come in contact with contaminants in the shallow river sediments while entering or exiting the river during recreational activities.

6.4: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water.

The Fish and Wildlife Resources Impact Analysis (FWRIA) for OU 02, which is included in the RI report, presents a detailed discussion of the existing and potential impacts from the site to fish and wildlife receptors.

OU1 - The primary contaminants of concern are found in coal tar that was the by-product from the operation of the former MGP. Site investigations revealed that both soil and groundwater are contaminated with volatile and semi-volatile organic compounds exceeding SCGs mainly at depth throughout the site. Non-aqueous phase liquids (NAPL) were found in soil at depths ranging from 6 to 22 feet below ground surface (bgs) on-site. The remedy to address the OU1 contamination was identified in the March 2011 Record of Decision.

OU2 - Site investigations indicated that coal tar has migrated off-site or was directly discharged onto OU2 resulting in both soil and groundwater contamination. As in OU1, contaminants of concern at OU2 include volatile and semi-volatile organic compounds and are found at concentrations exceeding SCGs. NAPL saturated soil was found at depths ranging from 10 to 20 feet bgs.

OU3 - The remedial investigation conducted at the site indicates that sediments in the Hudson River embayment adjacent the site have been impacted by contaminants resulting from the operation of the former MGP. Analytical results from sediment samples obtained near the mouth of the storm water outfall discharging into the embayment have shown MGP related impacts. The nature and extent of the impacts detected will be further evaluated during the remedy selection phase for OU3 portion of the site.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.

RAOs for Environmental Protection

- Prevent the discharge of contaminants to surface water.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

To be selected, the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 6.5. Potential remedial alternatives for the Site were identified, screened and evaluated in the FS report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit B. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit C.

The basis for the Department's proposed remedy is set forth at Exhibit D.

The estimated present worth cost to implement the remedy is $27,500,000. The cost to construct the remedy is estimated to be $27,200,000 and the estimated average annual cost is $17,200.

The elements of the proposed remedy are as follows:

1) A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. Notably a pre-design investigation will be performed to determine the depth and extent of excavation for those properties which were not fully delineated during the RI. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site

management of the remedy as per DER-31. The major green remediation components are as follows:

a) Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;

b) Reducing direct and indirect greenhouse gas and other emissions;

c) Increasing energy efficiency and minimizing use of non-renewable energy;

d) Conserving and efficiently managing resources and materials;

e) Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;

f) Maximizing habitat value and creating habitat when possible;

g) Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and

h) Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2) Excavation and off-site disposal of MGP impacted soil at properties located on West Street, 111-117 Maple Avenue; the Apartment Complex and the alleyway. Soil cleanup objectives (SCOs) to allow the residential use of the site will guide the excavation of contaminated soils with the exception of use of the site-specific SCO for total PAHs of 25 ppm based on background conditions. Approximately 30,000 cubic yards of soil will be removed and sent off site for disposal at a permitted facility. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7d will be brought in to replace the excavated soil. No demolition of occupied buildings is anticipated.

3) The existing buildings and pavement at the site will form a portion of the site cover. Where there will be exposed surface soil, a site cover will be maintained as a component of any future site development, which will consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where the soil cover is required it will be a minimum of two feet of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for restricted residential use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

4) A vertical barrier wall will be installed in those areas where the excavation will not be completed beneath the existing structures to prevent recontamination of the remediated areas by contamination remaining under the buildings. The type of barrier wall will be determined during the design phase of the project.

5) Excavation activities will occur in the immediate vicinity of an existing stormwater drainage line to remove contaminated soil around or within the beddings of the drainage line. The need to protect or relocate the line to allow the necessary excavation will be determined during the design phase of the project, provided contaminated materials are addressed consistent

with the remedial objectives and subject to field verification by the Department's on-site representative during construction.

6) Odor, noise and dust control measures including the use of a temporary structure (to the extent practicable) will be implemented during excavation to limit the impacts of remedial activities on the public. Groundwater extracted during construction will be sent off-site for treatment and disposal or treated on-site and discharged in compliance with applicable discharge standards

7) Following the excavation, if determined necessary, the remaining impacted site groundwater will be treated using an in-situ treatment technique to enhance natural attenuation. An oxygen injection system is currently being considered, with the final determination of the in-situ groundwater treatment to be made during the design phase of the project.

8) The site management plan (SMP) required for OU1 of the site will be developed and implemented to incorporate the OU2 remedy. The SMP will identify the institutional controls and engineering controls (IC/ECs) required for the remedy and detail their implementation. The plan will include, but may not be limited to:

a. an Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Engineering Controls: A site cover currently exists on the northern portion of OU2 and consists of buildings, pavement, sidewalks and landscaped areas. This cover will be maintained to allow for residential use of the site. Any site redevelopment will require remedial action in this area (see bullet 8 below). This plan includes, but may not be limited to:

i. Excavation Plan which details the provisions for management of future excavation in areas of remaining contamination;
ii. provisions for the management and inspection of the identified engineering controls and groundwater use controls;
iii. a groundwater monitoring plan to assess the performance and effectiveness of the remedy.
iv. a schedule of monitoring and frequency of submittals to the Department; and

9) Areas of subsurface contamination have been determined to currently be inaccessible due to the presence of buildings/structures, an unknown quantity of impacted material will remain in the front and under the existing buildings which may need to be addressed at a future point in time to complete this remedy. The impacted material will be subject to further characterization and removal and/or treatment, should the demolition of the buildings occur as part of a future redevelopment of this area.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were evaluated. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into two categories: volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified in Section 6.1.1 are also presented.

Waste/Source Areas

As described in the RI report, waste/source materials were identified at the OU-2 portion of the site and are impacting groundwater, soil, and potentially surface water and sediment in the Hudson River embayment.

Wastes are defined in 6 NYCRR Part 375-1.2 (aw) and include solid, industrial and/or hazardous wastes. Source Areas are defined in 6 NYCRR Part 375 (au). Source areas are areas of concern at a site were substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium. Wastes and Source areas were identified at the site.

Manufactured gas was cooled and purified prior to distribution. Two principal waste materials were produced in this process: coal tar and purifier waste. Coal tar is a reddish brown to black oily liquid by-product which formed as a condensate as the gas cooled. Purifier waste is a mixture of iron filings and wood chips which was used to filter and remove cyanide and sulfur gases from the mix prior to distribution.

Coal tar does not readily dissolve in water. Materials such as this are commonly referred to as non-aqueous phase liquid, or NAPL. The term NAPL and coal tar are used interchangeably in this document. Although most coal tars are slightly denser than water, the difference in density is slight. Consequently, they can either float or sink when in contact with water.

Specific volatile organic compounds (VOCs) of concern are benzene, toluene, ethylbenzene and xylenes. These are referred to collectively as BTEX in this document. Specific semivolatile organic compounds of concern are the polycyclic aromatic hydrocarbons (PAHs):

acenaphthene	benzo(g,h,i)perylene	*indeno(1,2,3-cd)pyrene*
acenaphthylene	*benzo(k)fluoranthene*	2-methylnaphthalene
anthracene	*chrysene*	naphthalene
benzo(a)anthracene	*dibenzo(a,h)anthracene*	phenanthrene
benzo(a)pyrene	fluoranthene	pyrene
benzo(b)fluoranthene	fluorene	

Total PAH concentrations as referred to in this plan are the sum of the individual PAHs listed above. The italicized PAHs are probable human carcinogens.

Source areas were identified at the site as noted on Figure 3. Coal tar was found at depths ranging from 10 to 20feet below the ground surface.

The waste/source areas identified will be addressed in the remedy selection process.

Groundwater

Groundwater samples were collected from monitoring wells and analyzed for volatile, semivolatile, and metals compounds to assess the nature and extent of groundwater impacts at OU2 resulting from the operation of the former MGP. The primary contaminants of concerns are benzene, ethylbenzene, toluene and xylene (collectively refer to as BTEX) and polycyclic aromatic hydrocarbon (PAH) compounds. The results indicate that groundwater contamination exceeds the SCGs for BTEX and PAH compounds. BTEX compounds were detected at concentrations ranging from non detect to approximately 898 parts per billion (ppb) while PAHs were found at concentrations ranging from non detect to approximately 9,630 ppb. Dense non-aqueous phase liquid (DNAPL) was detected at several monitoring wells located in the northwest portion of the site near the properties on West Street. Site related impacts do not appear to have significantly affected groundwater quality beyond the OU2 boundaries as shown in Figures 1 and 2. Metals were determined not to be contaminants of concern in groundwater. Groundwater is not used as a potable water supply locally as the surrounding area is served by public water.

Table 1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
Benzene	2.4-320	1	6 of 15
Toluene	0.5-18	5	1 of 15
Ethylbenzene	9.4-3.50	5	5 of 15
Xylene, Total	11-210	5	5 of 15
VinylChloride	0-7.0	2	1 of 15
SVOCs			
Acenaphthene	7.3-310	20	15
Fluorene	0.7-59	50	1 of 15
Naphthalene	0.8-9200	10	6 of 15
Phenanthrene	0.3-64	50	1 of 15

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b- SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

Based on the findings of the RI, the past disposal of hazardous waste has resulted in the contamination of groundwater. The site contaminants that are considered to be the primary contaminants of concern which will

drive the remediation of groundwater to be addressed by the remedy selection process are: BTEX and PAHs related to MGP coal tar.

Soil

Subsurface soil samples were collected and analyzed for volatile, semivolatile, and metals compounds at the OU2 study area during the RI to determine the nature and extent of impacts to soil, as a result of the operation of the former MGP. Subsurface soil impacts exceeding SCOs were detected across the study areas in OU2 and they were encountered at depths ranging from 7 to 25 feet below ground surface (bgs). Subsurface soil contamination was limited to properties between West Street and Maple Avenue. Total PAHs and BTEX contamination was detected at concentrations ranging from non detect to approximately 40,000 and 1,100 ppm, respectively. The highest concentration of PAHs was detected in a soil boring located in the northwest portion of the site, behind the apartment complex. Source material impacts were encountered primarily in the former pond area, currently the rear parking areas for the residences. The nature and extent of soil contamination at OU2 is depicted in Figure 2. Table 2 shows a summary of soil contamination for each class of compounds of concern.

Table 2 - Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Residential SCG[c] or Protection of Groundwater SCG[d] (ppm)	Frequency Exceeding Residential SCG
VOCs					
Benzene	.0007-170	0.06	12 of 68	0.06[d]	12 of 68
Toluene	.0004-29	0.7	8 of 68	0.7[d]	8 of 68
Ethylbenzene	.0008-520	1	17 of 68	1[d]	17 of 68
Xylene, Total	.0017-410	0.26	22of 68	100 (1.6[d])	4 of 68
Acetone	.016-.21	0.05	21 of 68	0.05[d]	21 of 68
Methylene chloride	.0022-.053	0.05	1 of 68	51	0 of 68
SVOCs					
Acenaphthene	.012-3200	20	14 of 68	100	7 of 68
Acenaphthylene	.021-280	100	2 of 68	100	2 of 68
Anthracene	.016-3000	100	7 of 68	100	7 of 68
Benzo[g,h,i]perylene	.016-270	100	3 of 68	100	3 of 68
Fluoranthene	.01-1900	100	9 of 68	100	9 of 68
Fluorene	.02-1300	30	11 of 68	100	6 of 68

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Residential SCG[c] or Protection of Groundwater SCG[d] (ppm)	Frequency Exceeding Residential SCG
Naphthalene	.01-7000	12	18 of 68	12[d]	18 of 68
Phenanthrene	.0096-5600	100	13 of 68	100	13 of 68
Pyrene	.021-2500	100	11 of 68	100	11 of 68
Benz[a]anthracene	.011-760	1	29 of 68	1	29 of 68
Benzo[a]pyrene	.015-660	1	29 of 68	1	29 of 68
Benzo[b]fluoranthene	.01-220	1	27 of 68	1	27 of 68
Benzo[k]fluoranthene	.017-540	0.8	30 of 68	1	30 of 68
Chrysene	.011-930	1	28 of 68	1	28 of 68
Dibenz[a,h]anthracene	.016-45	0.33	18 of 68	0.33	18 of 68
Indeno[1,2,3-cd]pyrene	.014-190	0.5	26 of 68	0.5	26 of 68

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Residential Use, unless otherwise noted.
d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Groundwater.

Based on the findings of the Remedial Investigation, the presence of MGP related contamination including DNAPL has resulted in the contamination of soil. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are, polycyclic aromatic hydrocarbons (PAHs) and benzene, toluene, ethylbenzene and xylene (BTEX) compounds associated with residues from the operation of the former MGP.

Surface soil samples were not collected at OU2 as most of the area is covered with buildings and pavement.

Based on the findings of the Remedial Investigation, the past disposal of hazardous waste has resulted in the contamination of soil. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are BTEX and PAHs related to MGP coal tar. To the extent surface soil has been impacted by past disposal practices, this contamination will be addressed in conjunction with the remediation of the identified subsurface contamination.

Surface Water and Sediments

Sediment samples collected from the Hudson River embayment revealed elevated levels of PAHs. The nature and extent of the detected impacts will be determined and addressed as part of the OU3 remedial program. There is no evidence of surface water impacts based on the RI results.

Soil Vapor

The evaluation of the potential for soil vapor intrusion resulting from the presence of site related soil or groundwater contamination was evaluated by the sampling of soil vapor, sub-slab soil vapor under structures, and indoor air inside structures. At this site due to the presence of buildings in the impacted area a full suite of samples were collected to evaluate whether soil vapor intrusion was occurring.

Soil vapor samples were collected from the sub-slab of several residential properties located on the OU2 portion of the site. Indoor air and outdoor air samples were also collected at this time. The samples were collected to determine whether actions are needed to address exposures related to soil vapor intrusion.

Based on the concentration detected, and in comparison with the NYSDOH Soil Vapor Intrusion Guidance, no site-related soil vapor contamination of concern was identified during the RI. Therefore, no remedial alternatives need to be evaluated for soil vapor.

Exhibit B

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Section 6.5) to address the contaminated media identified at the site as described in Exhibit A.

Alternative 1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment. The No Action alternative does not include long-term monitoring and therefore has no associated cost.

Alternative 2: NAPL Recovery, In-Situ Groundwater Treatment and Natural Attenuation (NA)

This Alternative will include:

- NAPL recovery from the areas containing recoverable NAPL;
- maintenance of existing paved areas to prevent contact and act as low-permeability soil cover to limit infiltration of precipitation in the most impacted areas;
- in-situ treatment such as oxygen injection and NA to address groundwater impacts; and
- development of a site management plan to include engineering controls to prevent exposure to impacted subsurface soil and groundwater.

The cost to implement Alternative 2, based on an annual operation and maintenance (O&M), for a period of 30 years has been estimated as follows:

Present Worth: ..... $ 2,086,000
Capital Cost:..... $1,125,000
Annual Costs:..... $ 62,500

Alternative 3: NAPL Recovery, Phased Soil Excavation, Barrier Wall Installation, In-situ Groundwater Treatment and NA

This alternative provides for all the requirements of Alternative 2 plus phased soil removal and soil cleanup to Part 375 Residential or Restricted Residential SCOs. This alternative will include options that will be implemented in two phases.

Phase 1 will include:

- NAPL recovery as described in Alternative 2 and will be continued until a future demolition of the apartment complex would allow for the soil excavation as described in Phase 2;
- excavation of contaminated soil exceeding Part 375 Residential SCOs at the West Street properties to depths ranging from 15 to 17 feet bgs;
- installation of a vertical barrier to prevent recontamination of the area adjacent source material present in the apartment complex;
- backfill of the excavated areas with clean soil to bring the site to design grade;
- groundwater monitoring following Phase 1 to document groundwater conditions prior to Phase 2; and

- development of a site management to include institutional and engineering controls to prevent exposure to impacted subsurface soil and groundwater.

Phase 2 will include the following actions to be taken in the future should demolition of the existing buildings located at 111-117 Maple Avenue and the apartment complex parcels occur:

- excavation of contaminated soil exceeding Part 375 Restricted Residential SCOs or background levels to a maximum depth of 15 feet bgs for the Apartment Complex property;
- excavation of contaminated soil exceeding Part 375 Residential SCOs or background levels for the 111-117 Maple Avenue properties to a maximum depth of 15 feet bgs;
- NA and in-situ groundwater treatment, if determined necessary; and
- the site management plan would also include engineering controls on groundwater use.

The cost to implement Alternative 3, based on an annual operation and maintenance (O&M), for a period of 30 years has been estimated as follows:

Present Worth: ..... $ 17,297,000
Capital Cost:..... $ 16,725,000
Annual Costs:..... $ 37,200

Alternative 4: NAPL Recovery, Phased Removal to Part 375 Residential/Restricted Residential SCOs and Source Area Removal in Phase 1 and In-situ Groundwater Treatment and NA

This alternative has the same components as in Alternative 3 but will include additional excavation in the areas near and within the MW-32S NAPL location thereby eliminating the need for the installation of a barrier wall to prevent recontamination of cleaned areas. Specific components of this alternative will include:

Phase 1:

- NAPL recovery as described in Alternative 2 and will be continued until a future demolition of the apartment complex would allow for the soil excavation as described in Phase 2;
- excavation of contaminated soil exceeding Part 375 Residential SCOs or background levels to a maximum depth ranging from 15 to 17 feet bgs for single family residences located on West Street;
- soil removal in the vicinity of MW-32S containing NAPL and soil within this area exceeding Part 375 Restricted Residential SCOs or background levels to eliminate the potential for recontamination of the adjacent excavated areas;
- groundwater monitoring; and
- development of a site management to include engineering controls to prevent exposure o impacted subsurface soil and groundwater.

Phase 2 will include the following actions to be taken in the future should demolition of the existing buildings located at 111-117 Maple Avenue and the apartment complex parcels occur:

- excavation of contaminated soil from the apartment complex and properties located at 111-117 Maple Avenue for soil exceeding Part 375 Residential SCOs or background levels to a maximum depth of 15 feet bgs;
- NA and in-situ treatment of groundwater, if determined necessary; and

- development of a site management to include institutional and engineering controls to prevent exposure to impacted subsurface soil and groundwater.

The cost to implement Alternative 4, based on an annual operation and maintenance (O&M), for a period of 30 years has been estimated as follows:

Present Worth: ..... $ 20,406,000
Capital Cost:..... $19,700,000
Annual Costs:..... $45,900

Alternative 5: Phased Soil Removal to Part 375 Residential Levels, Barrier wall installation and Groundwater Treatment

This alternative has been modified from the FS and will include soil removal as close as possible to the existing buildings to meet Residential SCOs. Non-accessible material will be removed in a second phase, subject to future building demolition.

Phase 1 will include:

- excavation of contaminated soil exceeding Part 375 Residential SCOs or the established background value for total PAHs of 25 ppm in the areas identified on Figure 3, including the single family properties located on West Street, town houses located on 111 to 117 Maple Avenue, and the apartment complex and alleyway between West Street and Maple Avenue to depths up to 17 feet bgs;
- backfill of excavated areas with clean soil meeting Part 375 residential SCOs from an off-site location to establish the design grade at the site;
- installation of a vertical barrier wall in select areas as needed to prevent recontamination of the remediated areas. The type of barrier wall will be determined during the design phase;
- protection, temporary bypass, or removal/replacement of the 54 inch stormwater pipe present in the Alleyway;
- groundwater monitoring to assess the effectiveness of the remedy;
- development of a site management to include appropriate engineering controls to prevent exposure to impacted subsurface soil (e.g. soil remaining in front and under the buildings); and
  .

Phase 2 will include the following actions to be taken in the future, should demolition of the existing buildings located at 111-117 Maple Avenue and the Apartment Complex parcels occur:

- excavation of contaminated soil in the front, under and adjacent to the apartment complex and properties located at 111-117 Maple Avenue for soil exceeding Part 375 Residential SCOs or background levels;
- the depth of excavation and removal of the sheeting will be established after a focused investigation is complete to determine the lateral and vertical extent of impacted material in the front, under and adjacent to the buildings; and
- NA and groundwater treatment using in-situ treatment technology such as oxygenation, if determined necessary;

The cost to implement Alternative 5, based on an annual operation and maintenance (O&M), for a period of 30 years has been estimated as follows:

Present Worth: ..... $ 27,500,000
Capital Cost:..... $27,200,000
Annual Costs:..... $17,200

Alternative 6: In-Situ Solidification (ISS) of Source Materials and Soil removal in Non-ISS Areas.

This Alternative will address the impacted soil by using ISS instead of excavation of accessible source material on the apartment complex parcel and on the Alleyway.

Alternative 6 will include the following components:

- perform ISS in the source areas to depths ranging from approximately 15 to 17 feet bgs. Prior to ISS, the materials located at the top 5 feet in the ISS area will be excavated or pre-cut to remove below grade obstructions;
- demolition and temporary bypass of the 54 inch stormwater pipe;
- excavation of contaminated soil exceeding Part 375 Residential SCOs or background levels to a maximum depth ranging from 15 to 17 feet bgs for single family residences located on West Street ;
- installation of a storm drain utility corridor through the ISS mass to facilitate the reinstallation of a new 54 inch storm line and its branches. The utility corridor will be backfilled with clean fill to prevent future contact with solidified material by construction workers performing maintenance on the storm drain system;
- installation of a minimum 2 feet of clean soil cover over the entire ISS area;
- groundwater monitoring to determine the effectiveness of the proposed remedy;
- development of a site management to include engineering controls to prevent exposure to impacted subsurface soil and groundwater.

Phase 2 will include the following actions to be taken in the future should demolition of the existing buildings located at 111-117 Maple Avenue and the apartment complex parcels occur:

- future excavations of impacted materials beneath and adjacent to the apartment complex buildings if and when the apartment complex is demolished in the future. The depth of excavation will be established after a focused investigation is complete to determine the lateral and vertical extent of impacted material at the parcels; and
- groundwater treatment using in-situ treatment technology such as oxygenation and natural attenuation

The cost to implement Alternative 6, based on an annual operation and maintenance (O&M), for a period of 30 years has been estimated as follows:

Present Worth: $19,664,000
Capital Cost:..... $19, 400,000
Annual Costs:..... $17,200

Alternative 7: Restoration to Unrestricted Conditions

This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil cleanup objectives listed in Part 375-6.8 (a). This alternative would include: excavation and off-site disposal of nearly all waste and soil contamination above the unrestricted soil cleanup objectives. The remedy will not rely on institutional or engineering controls to prevent future exposure. There is no Site

Management, no restrictions, and no periodic review. This remedy will have no annual cost, only the capital cost.

This alternative will include excavation of soil exceeding the Part 375 Unrestricted SCOs or background levels in the OU2 area to predisposal condition and will require the demolition of the Apartment Complex and the building at 111-117 Maple Avenue. The components of this alternative will include the following:

- acquisition and demolition of buildings currently located at OU2;
- excavation of contaminated soil exceeding Part 375 Unrestricted SCOs or background levels to a depth of approximately 15 to 17 feet bgs. Approximately 90,000 cubic yards of impacted material will be removed for treatment and/disposal at an off-site permitted facility;
- excavation will be conducted within a temporary fabric structure (to the extent practicable) to control odor, vapor and dust; and
- backfilling the excavated areas with certified clean soil from an off-site location. The site will be restored to a pre-disturbance grade.

The cost to implement Alternative 7 has been estimated as follows:

Present Worth: $42,000,000
Capital Cost:..... $42,000,000
Annual Costs:..... $0

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
No Action	0	0	0
Alternative 2: NAPL Recovery and In-Situ Groundwater Treatment / NA	$1,125,000	$62,500	$2,086,000
Alternative 3: NAPL Recovery and Phased Soil Excavation with In-situ Groundwater Treatment and NA	$16,725,000	$37,200	$17,297,000
Alternative 4: NAPL Recovery, Phased Removal to Part 375 Residential/Restricted Residential Levels and Removal of the MW-32S Area in Phase 1, with In-situ Groundwater Treatment and NA	$19,700,000	$45,900	$20,406,000
Alternative 5: Phased Soil Removal to Part 375 Residential Levels, with Removal of Currently Accessible impacted Material	$27,200,000	$17,200	$27,500,000
Alternative 6: ISS, with Phased Removal to Part 375 Residential Levels in Non-ISS Areas	$19,400,000	$17,200	$19,664,000
Alternative 7: Purchase and Demolition of Buildings followed by Removal of Soil Exceeding Unrestricted Levels	$42,000,000	0	$42,000,000

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 5, Soil Removal to Part 375 Residential SCO Levels, with Removal of Currently Accessible impacted Material to the extent practicable as the remedy for the OU2 portion of the site. Alternative 5 will achieve the remediation goals for the site by reducing the volume, toxicity and mobility of contaminated soil due to removal and off-site disposal of contaminated material. The proposed remedy will greatly reduce the source of contamination to groundwater and will treat contaminated groundwater using in-situ technology. Given that OU2 portion of the site is zoned for residential use, this alternative has been modified from the FS to allow the site to be remediated to meet residential cleanup objectives by addressing all currently accessible contaminated materials to residential SCOs, taking into account site background levels for PAHs. The original alternative presented in the FS calls for the removal of source material in the initial phase while addressing the remaining impacted soil in the second phase after the buildings have been demolished. The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figure 3 and 4.

Basis for Selection

The proposed remedy is based on the results of the RI and the evaluation of alternatives. The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

Alternative 1 (No Action) does not include active remedial actions and thus will not provide any additional protection to human health and the environment over what currently exists. Additionally, this alternative will not comply with SCGs; since source material will remain in place and continue to pose a threat to both human health and the environment. Alternative 2 (NAPL recovery, in-situ groundwater treatment and NA) will not meet the SCGs nor satisfy the RAOs in a reasonable time. Therefore, Alternatives 1 and 2 are eliminated from further evaluation.

Alternatives 3,4,5,6 and 7 will all provide some level of protection to public health and the environment and were retained for further evaluation.

Alternatives 3 and 4 will provide less protection to the public health and the environment as most of the accessible material will be addressed in the distant future and will not meet residential use SCOs. Alternative 6 will provide a lesser amount of protection to the public health and the environment as some portion of the site will not be addressed to meet residential use SCOs. In addition, the material that has been solidified will remain in place at the site. Alternative 5 will achieve protection by immediate excavation and off-site disposal of all the accessible materials to readily provide for residential use. Alternative 5 will provide permanent reduction of volume of impacted materials due to removal and off-site treatment and/or disposal.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In

addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

Alternatives 3 and 4, which provide for phased implementation of remedy, will meet the SCGs when both phases are implemented. These alternatives will remove MGP source material that may continue to contaminate other media, including groundwater, and will provide soil cover and institutional controls to protect public health. However, Alternatives 3 and 4 will not meet SCOs for residential use as contaminated materials exceeding background levels will be left at depth. In addition, these two alternatives will defer remediation of accessible materials till later phase of remedy implementation. Satisfactory implementation of these alternatives will occur at an unknown time in the future and will depend on when the existing buildings are demolished for redevelopment. Alternative 5 will better achieve the SCGs by removing all currently accessible MGP impacted soil for off-site disposal and/or treatment, thereby eliminating the likelihood of off-site migration of contaminants and limiting exposure. All accessible impacted materials will be removed in the first phase to meet residential use SCOs or established background levels of 25 ppm total PAHs. Under this alternative, groundwater will be actively treated to enhance natural attenuation of groundwater contamination. Alternative 5 will also include a second phase remedial activities to include removal of impacted soil not currently accessible that may be present in the front and under the existing buildings at such time as these buildings are demolished in the future. This alternative will include a site management plan to prevent public exposure to remaining contamination that may be left at depth. Alternative 6 will also achieve these threshold criteria by using a combination of soil excavation and in-place treatment of some other contaminated material using ISS. However, this alternative will only address source material and will not clean the site to residential use levels in all of OU2 area. Some currently accessible material above residential SCO or background levels will be left untreated until sometime in the future. This alternative will provide soil cover and include institutional controls for the protection of public health. Alternative 7 will provide greater protection to human health and the environment by removing all contaminated material from the site. Alternative 7 will meet the threshold criteria and ROAs.

The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

Long-term effectiveness is best achieved by Alternative 7, since nearly all contaminated material will be removed from the site to achieve the unrestricted use SCOs. Alternatives 3 and 4 will provide limited long-term effectiveness only at the completion of both phases of remedy as most of the soil removal is scheduled for implementation in phase 2. Alternative 5 will provide greater long-term effectiveness as the vast majority of impacted material will be removed during the initial phase of remedy implementation. Further removal will occur in the future if and when the existing buildings are demolished. Alternative 6 will provide some long-term effectiveness through ISS treatment of source material in the apartment complex area and removal of contaminated material in the single family properties. The site management will include provisions for Alternatives 5 and 6 to reliably prevent future potential exposures. While Alternative 6 will provide a reasonable level of effectiveness, there are several uncertainties that need resolution. Site investigation indicates that soil stratigraphy in some areas of the target treatment area include a fair amount of peat layers which may prove difficult when in contact with ISS mixtures. In addition, the targeted treatment area is located close to

residential properties with limited working areas; as such may pose logistical challenges in terms of limiting impacts to the nearby residences. To be considered for proposal, treatability studies will be necessary and detailed engineering evaluations will need to be performed to determine site specific suitability of this technology at the site and the apartment complex area will need to be cleaned to allow for unrestricted residential use consistent with the current zoning.

4. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

Alternatives 3 and 4 will provide a reduction in toxicity, mobility and volume. However, this will be achieved when both remedial phases are implemented. Alternative 3 and 4 will address 9,000 and 12,000 cubic yards of source material, respectively during the initial phase of remedy implementation. Alternative 5 will provide reduction in toxicity, mobility and volume as all accessible contaminated material (approximately 30,000 cubic yards) will be removed through excavation to meet residential SCOs or background levels. Contaminated groundwater will be treated in-place under Alternative 5. Alternative 6 will reduce toxicity and mobility of on-site source material by ISS process. Alternative will achieve some level of volume reduction due to the removal of some impacted material to an approved off-site facility for disposal. Alternative 7 will permanently reduce the toxicity, mobility and volume as nearly all contaminated material at the site will be removed for off-site disposal and/or treatment.

5. Short-term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

Alternatives 3,4,5,6 and 7 will all have short-term impacts to the community and workers due to construction activities. Alternatives 3 and 4 with lesser immediate soil removal will result in the lowest level of short-term impacts compared to the proposed alternative. Alternative 5, which will address a greater volume of impacted material. will result in fewer impacts to the community compared to Alternatives 6. The best and the most appropriate method of construction to limit impacts to the community will be determined during the design of the proposed remedy. Alternative 6 will encapsulate the impacted soil in place through solidification. Given the close proximity of the impacted material to residential properties, Alternative 6 will pose significant construction challenges and will result in greater short-term impact to the community. Alternative 7 with near total removal will result in the highest short-term impacts to the community since extensive excavation will result in a large amount of excavated material to be transported through the community for off-site treatment and/or disposal. In addition, implementation of this alternative will most certainly result in the displacement of residents currently occupying OU2.

Alternatives 3 and 4 will both take approximately four months to complete as most of the impacted materials will be left untreated. Alternatives 5 will be constructed in about 13 months. Alternative 6 will take approximately 12 months to complete. Alternative 7 with near total removal of the impacted materials to pre-disposal condition will take approximately 23 months to complete.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

Alternatives 3 and 4 are implementable but will require close coordination with occupants of affected residential properties. Alternatives 5 and 6 are also implementable but with a higher degree of difficulty when compared to Alternatives 3 and 4 due to the greater need to work in close proximity to residential buildings. Alternative 7 is less implementable and complex to perform, since the volume of soil to be excavated under this alternative is significantly higher than the volume of soil to be addressed under the other alternatives. Alternative 7 will require a significant amount of time to implement compared to Alternatives 5 and 6 and will result in displacement of residents and increased truck traffic due to the large volume of material to be transported on local roads for a considerable amount of time. Though Alternative 7 will result in greater reduction in the volume of contaminated soil, it will result in greater short-term disruption to nearby residents during construction, while providing minimal additional protection of human health and the environment compared to the proposed alternative.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

The costs of the alternatives vary significantly, as presented in Exhibit C. Alternatives 3 and 4, while resulting in lower cost for implementation compared to the other alternatives, will provide a lesser degree of protection to human health and the environment as the remedial actions will only address source material while leaving in-place other contaminated material exceeding residential SCOs or background levels. Removal of remaining contamination including source material associated with these alternatives will occur in an unknown time in the future .Alternative 6 though will result in lower cost compared to Alternative 5, but it will not clean the site to allow for residential use, as some impacted material exceeding residential SCOs or background levels will be left in-place. Alternative 7, to unrestricted use, will have the highest present worth cost with a minimal increase in the overall protectiveness of the remedy, over Alternative 5. The incremental cost of over $20 million and significant increase in community disruption and loss of homes associated with Alternative 7 over Alternatives 5 are not justified by the marginal increase in protection.

Alternative 5 while resulting in higher cost of implementation compared to Alternative 6 is the most desirable because it removes most contaminated material for off-site treatment and/or disposal and will meet SCOs for residential use. Also, Alternative 5 will provide the most certainty for remedy implementation compared to Alternative 6.

On the basis of the above evaluations, Alternative 5 offers the most balanced and cost effective remedy without sacrificing protection.

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

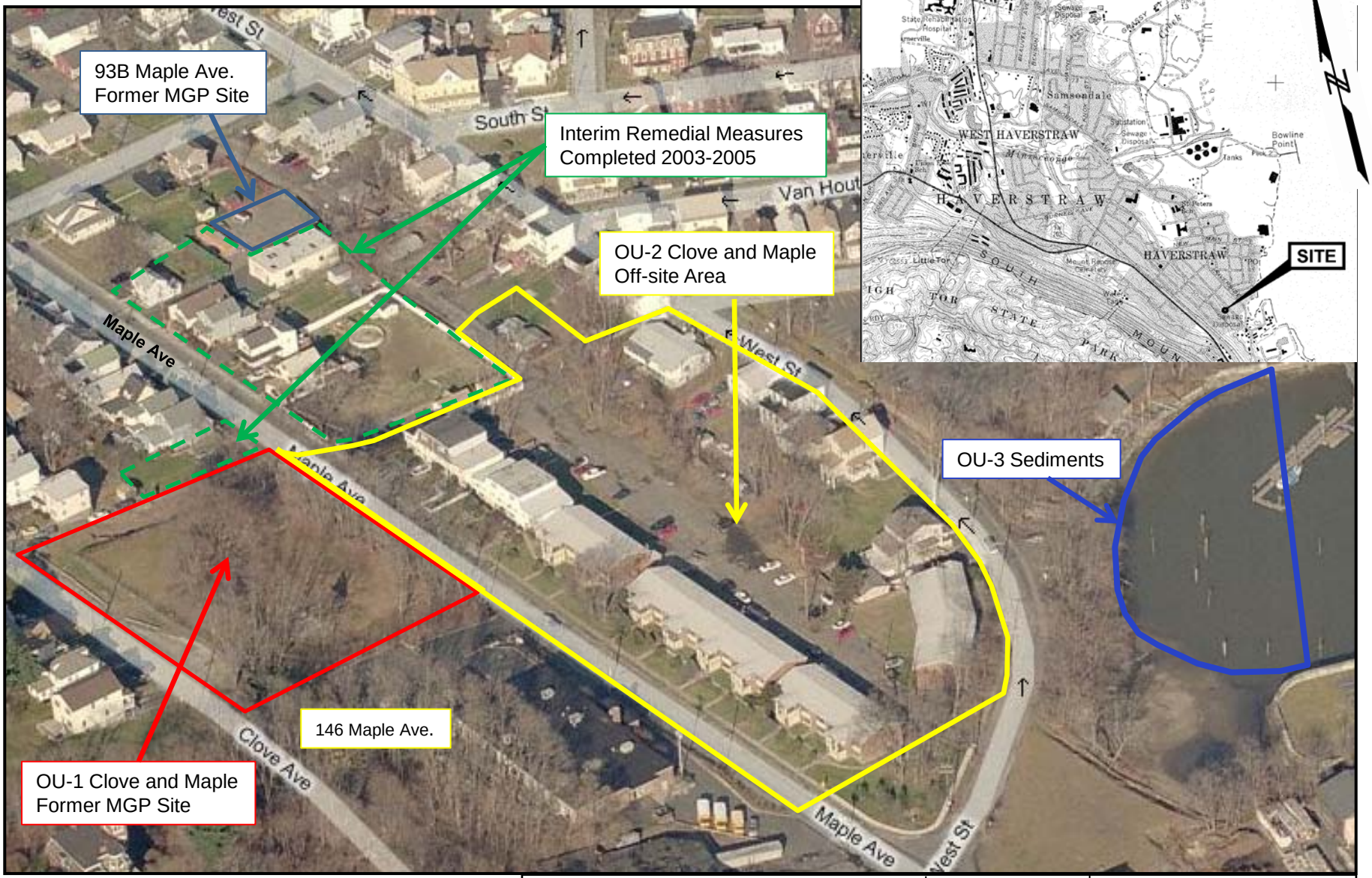
The current, intended, and reasonably anticipated future land use for the OU2 portion of the site is residential. Alternative 7 would achieve the unrestricted SCOs which would allow unrestricted land use of the property consistent with the current zoning. Alternative 5 meets this criterion by removing soil which exceeds the SCOs for residential use and allowing the current use of the apartment complex to continue until the properties are redeveloped in the future. Alternatives 3 and 4 will only meet the land use criterion at a future date when the buildings are removed and the contaminated soil is removed to meet the residential SCOs. Alternative 6 will

allow ISS treated soil to remain in the apartment complex area. However, Alternative 6 will not meet the potential future use and current zoning requirement of single family.

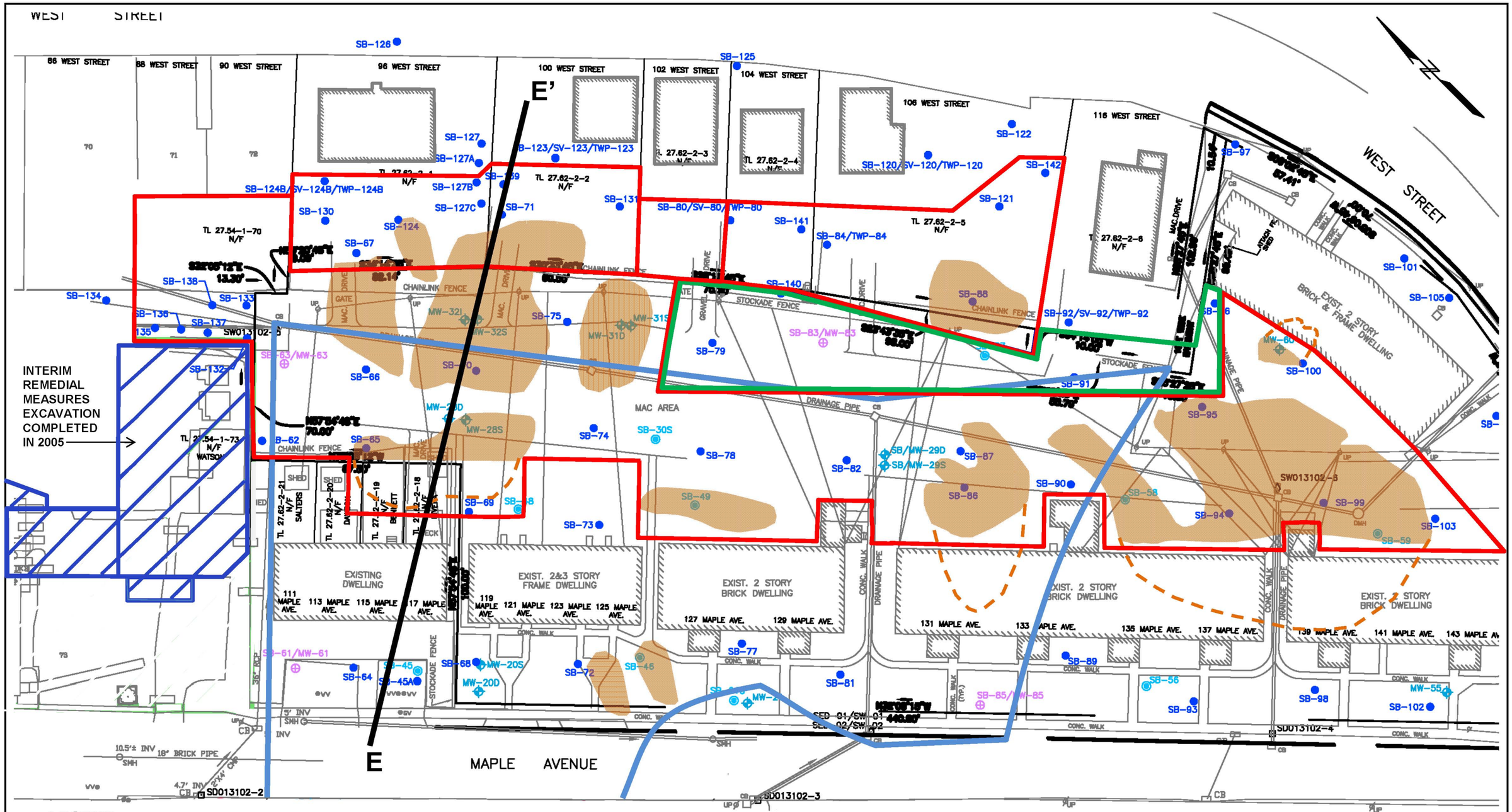
The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

Alternative 5 is being proposed because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.



CLOVE AND MAPLE FORMER MGP SITE HAVERSTRAW, NEW YORK		**OU-1 AND OU-2 LOCATION AERIAL PHOTOGRAPH**
ORANGE AND ROCKLAND UTILITIES, INC.		**February 2011** **Figure 1**



LEGEND:

- ADDITIONAL DELINEATION REQUIRED
- EXCAVATION OF MATERIAL WITH TPAHs >25 ppm
- APPROXIMATE EXTENTS OF GROUNDWATER EXCEEDANCES OF NYSDEC AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES
- APPROXIMATE EXTENT OF SOURCE MATERIAL (GREATER THAN 0.2 FEET IN THICKNESS) FROM EVS 3D MODEL
- EXTENT OF POTENTIAL SOURCE MATERIAL BENEATH BUILDINGS

NOTES:

1. NOT FOR BIDDING OR CONSTRUCTION
2. BASE MAP FROM PLATE 2, 1/28/2009, CMX REMEDIAL INVESTIGATION REPORT, MAY 2009
3. EXISTING DWELLINGS ON WEST STREET APPROXIMATE FROM AIR PHOTOS
4. IRM EXCAVATION LIMITS APPROXIMATE, BASED ON FIGURE 3, RECORD EXCAVATION PLAN, GEI IRM CERTIFICATION REPORT, 93B MAPLE AVE, MARCH 31, 2006.

0 40 80

SCALE, FEET

CLOVE AND MAPLE FORMER MGP SITE
HAVERSTRAW, NEW YORK

ORANGE AND ROCKLAND UTILITIES, INC.

Figure 3
Alternative 5 Phase 1

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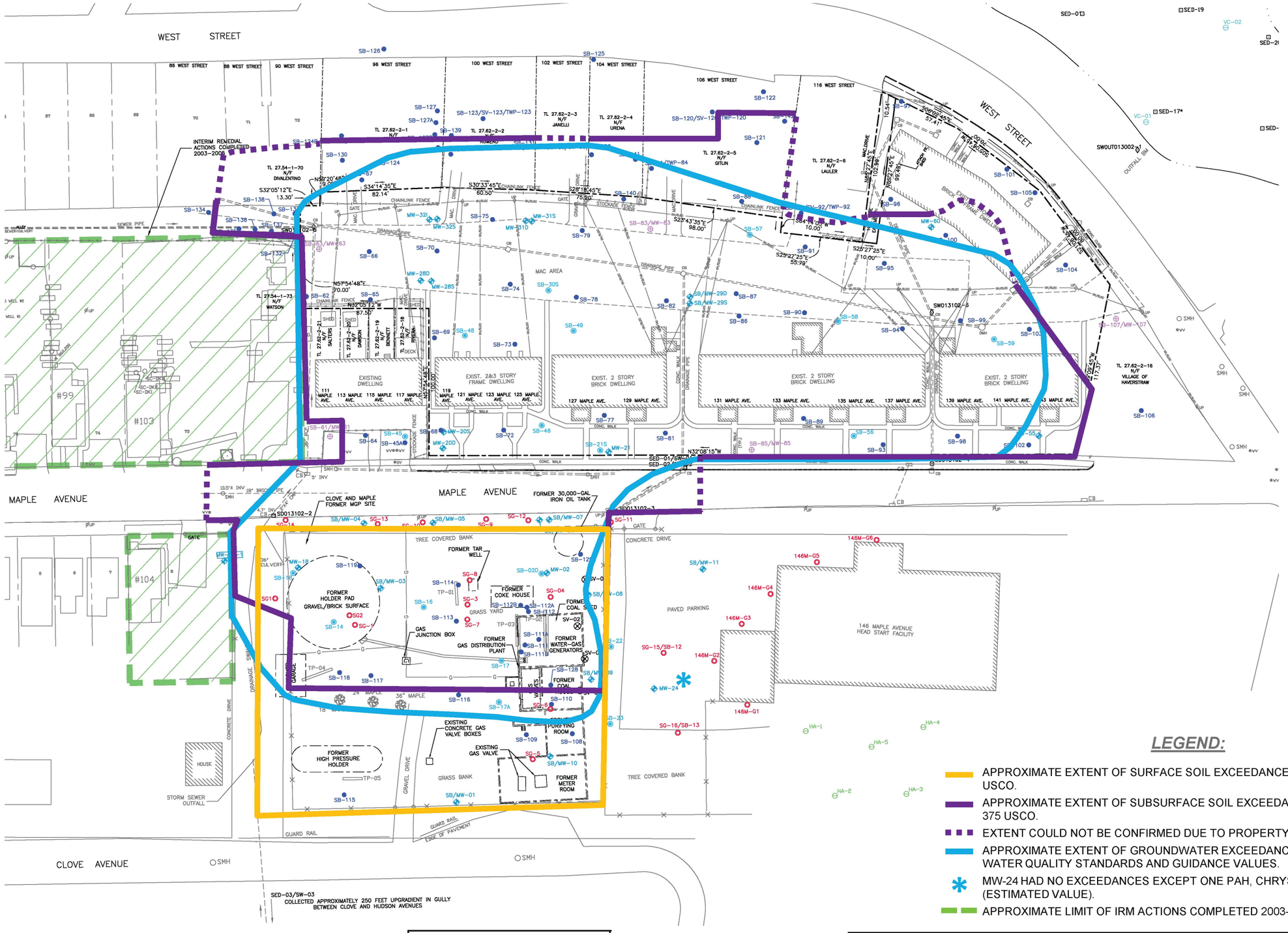


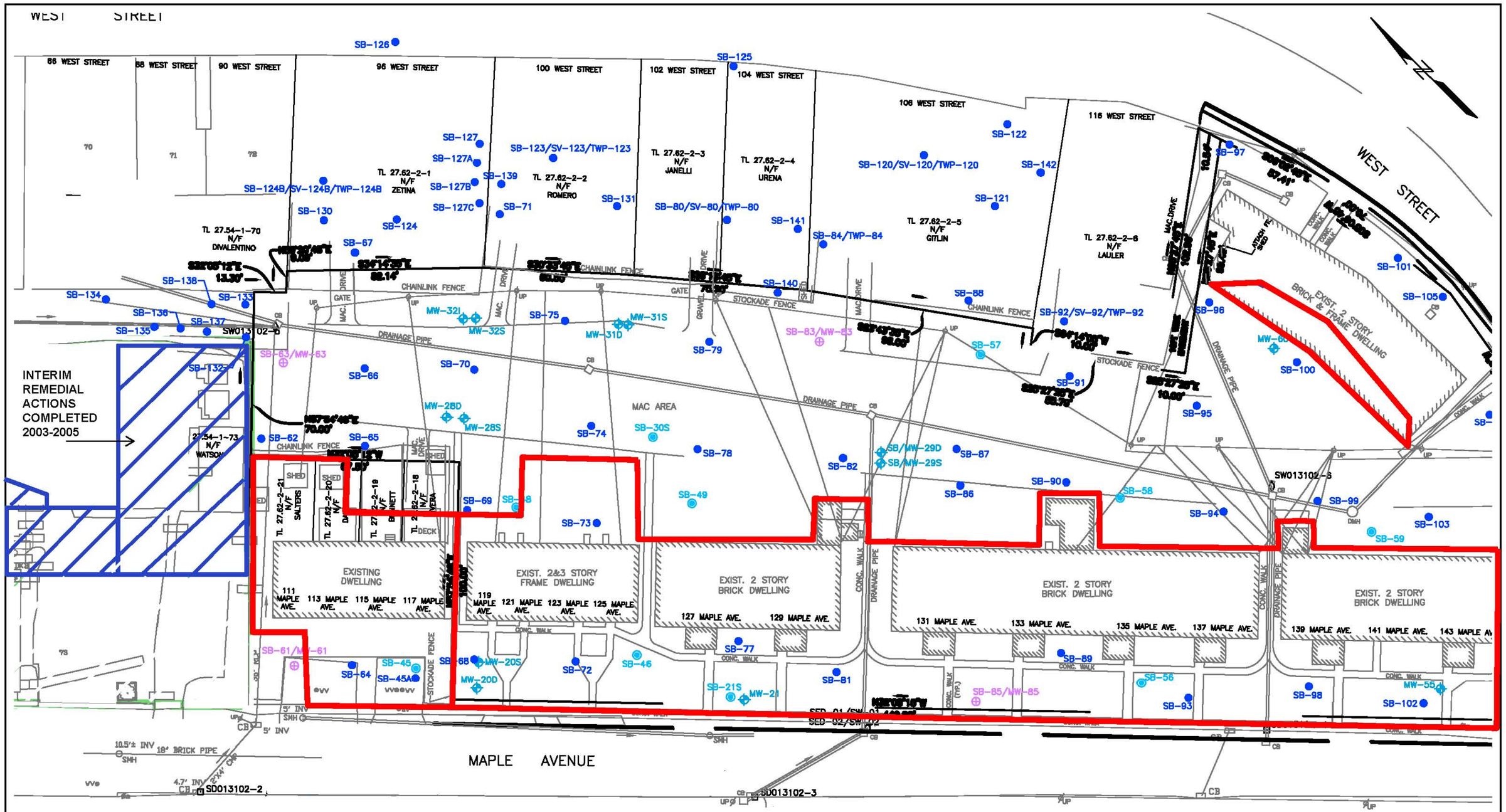
LEGEND:

- APPROXIMATE EXTENT OF SURFACE SOIL EXCEEDANCES OF NYSDEC PART 375 USCO.
- APPROXIMATE EXTENT OF SUBSURFACE SOIL EXCEEDANCES OF NYSDEC PART 375 USCO.
- EXTENT COULD NOT BE CONFIRMED DUE TO PROPERTY ACCESS RESTRICTIONS.
- APPROXIMATE EXTENT OF GROUNDWATER EXCEEDANCES OF NYSDEC AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES.
- * MW-24 HAD NO EXCEEDANCES EXCEPT ONE PAH, CHRYSENE, AT 0.5 mg/LJ (ESTIMATED VALUE).
- APPROXIMATE LIMIT OF IRM ACTIONS COMPLETED 2003-2005.

CLOVE AND MAPLE FORMER MGP SITE
HAVERSTRAW, NEW YORK

ORANGE AND ROCKLAND UTILITIES, INC.

Figure 2 Extent Soil and Groundwater Contamination



LEGEND:

EXCAVATION OF MATERIAL WITH TPAHs >25 ppm (ADDITIONAL DELINEATION REQUIRED UNDER STRUCTURES)

NOTES:

1. NOT FOR BIDDING OR CONSTRUCTION
2. BASE MAP FROM PLATE 2, 1/28/2009, CMX REMEDIAL INVESTIGATION REPORT, MAY 2009

0 40 80

SCALE, FEET

CLOVE AND MAPLE FORMER MGP SITE
HAVERSTRAW, NEW YORK

ORANGE AND ROCKLAND UTILITIES, INC.

Figure 4
Alternative 5 Phase 2

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